

CALL FOR PAPERS

IEEE International Conference

Integration of Knowledge Intensive Multi-Agent Systems

KIMAS'03: Modeling, Exploration, and Engineering

Sponsored by IEEE, US Air Force, US Army, US Navy, DARPA, AAI, INNS

General Chair – L. Perlovsky, US AF
Program Chair – A. Meystel, Drexel University
Assistant to Chairman – J. Schindler, US AF, ret'd
Tutorials Chair – M. Rangaswami, US AF
Publicity Chair – M. Kokar, Northeastern University
Publications Chair –
Local Arrangement Chair – Robert Alongi, IEEE Boston Section

Dates and places

Royal Sonesta Hotel, Cambridge MA
Boston 2-4 October 2003
Abstract due 1 January 2003
Proposals for tutorials and sessions 1 November, 2002
Notification of acceptance 1 March, 2002
Paper due 1 April, 2003

The Goals of the Conference

Knowledge Intensive Systems

Knowledge intensive systems emerge in multiagent applications when intelligent decision support requires knowing how this knowledge is produced, measured, and interpreted. Software packages for robots and data mining, control and communication systems for automated functioning, and systems for natural language processing, all these and similar systems rely on knowledge intensive processing with integration and decomposition intertwined.

Multiagent Intelligent Systems

All knowledge intensive system are multiagent ones. An agent is a concept of a device or a program that is significantly autonomous and goal-oriented; it performs its functions, and communicates with other agents while conducting goal-oriented activities and communicates as well as cooperates with other agents. Being equipped with sensors, collecting data, extracting information from them based o knowledge and integrating this information into knowledge – all of these are the details of the Decision Making processes that each agent and each multiagent system performs. Discovery and disambiguation of the system of interacting agents coordinated by the set of goals is the essence of knowledge construction required for the successful multi-agent decision making.

Computations Pertained to Intellect: Multiscale Search for Similarity

The main challenge of Multiagent Intelligent Systems is in the development of integrated knowledge-intensive computations processes and structures capable of transforming stored knowledge, learning from experience, and creating new knowledge by incorporating massive arrivals from multiple disciplines and sensors. This formidable problem is known to be resolved by a consecutive process of generalizing (a tool of integration) performed upon symbolic systems (semiotic tool). Computational procedures amount for the algorithms of

generalization. Integration via generalization leads to models that might be detailed or approximate, reflecting precisely known physical laws, or uncertain intuitions about undiscovered phenomena or human nature.

A Formidable Resemblance: Similar Algorithmic Structures

The algorithms of knowledge representation and decision making are surprisingly similar in all areas that employ Multiagent Intelligent Systems. This resemblance should not be taken lightly: it contains hints to answering many of questions. This conference will focus primarily upon areas important in scientific research, business, and defense operations: integrated closed-loop operation of data acquisition → information extraction → knowledge construction → action → data acquisition. Components of this closure demonstrate similar algorithmic structure. The conference will focus on tools and techniques of

- multiresolutional data, information, and knowledge analysis,
- entities discovery and recognition,
- exploratory large data arrays processing,
- signal and image analysis and interpretation,
- objects, scenes, and situation identification,
- design of efficient sensor systems,
- multimodal data fusion
- sensory and textual data fusion
- analysis of text messages
- natural language text interpretation
- integrated closed-loop operation

Domains of Application

Formulation or required behavior of Multiple Agents in Motion or Language oriented Decision Support Systems, generation of Desirable Behavior and design of the Action Networks consistent with the realistic systems is the purpose of R&D activities in all domains of business and engineering application: from management support and drug discovery to robotics and military operations applied in the following domains

- automatic target recognition
- design of intelligent communication systems in the network-centric environment
- generation of the common operational picture in battlefield
- analysis of situations in business and industry
- gene profiling and development
- drug discovery
- control of autonomous robotics.

Focal themes

The following fundamental ideas will be the focal themes at this conference:

1. Models and Similarity Measures for Image Recognition, Natural Language Processing, Situation Analysis
2. Multiagent Calculus: Theoretical Fundamentals for Analysis of Knowledge Intensive Systems
3. Multiresolutional Systems for Knowledge Representation
4. Mechanisms of Integration: Algorithms and Processes of Generalization/Instantiation
5. Architectures of Intellect-like Computational Processes
6. Search for Exploring Bodies of Data, Information, and Knowledge
7. Hypotheses Generation and Disambiguation in Knowledge Intensive Systems

**Researchers from academia, commerce, and defense research centers
will exchange ideas.**

Program managers will inform on the directions of research and development.

**The conference will include invited and contributed sessions,
plenary lectures and discussions,
government-only sessions,
and
tutorials.**